

IN THE ABSTRACT OF THE DISCLOSURE:

Please delete the abstract of the disclosure in its entirety, and substitute the following:

--A method and apparatus for performing an assay process, featuring providing microbeads in a solution; placing the microbeads on an alignment substrate; reading codes of the microbeads and the position thereof on the alignment substrate; reading the fluorescence on each microbead and the position order thereof on the alignment substrate; and determining an assay result based on bead position order and bead code of the earlier reading steps, where the microbead is an encoded particle having a particle substrate; a portion of the substrate being made of a substantially single material and having at least one diffraction grating embedded therein, the grating having a resultant refractive index variation within the single material at a grating location; and the grating providing an optical output signal indicative of a code when illuminated by an incident light signal propagating from outside said substrate, the optical output signal being a result of passive, non-resonant scattering from said grating when illuminated by said incident light signal.--